



United States Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine



Trace Forward Protocol

Phytophthora ramorum

Sudden Oak Death, ramorum blight, ramorum die back Protocol for Nurseries with Plant Material Shipped from a Confirmed *P. ramorum* Infested Nursery.

22 March 2004

Before inspection:

1. Notify state officials of your plans to inspect.
2. Coordinate visit with State inspector.

Survey/Inspection Procedure:

1. Identify yourself and agency to greenhouse/nursery owner/manager.
2. Tell greenhouse/nursery owner/manager the purpose of your visit.
3. Obtain copies of shipping documents related to target plants received from a confirmed *P. ramorum* infested nursery and forwarded to other nurseries or retail facilities.
4. Ask owner/manager to fill out questionnaire (attached).
5. Complete an Emergency Action Notification (EAN, PPQ form 523) to place a hold on target plants from the infested nursery and other host plants, products or articles that present a risk of spreading *Phytophthora ramorum* (e.g., growth media, equipment). Segregate the plants away from other host plants (see Table 1) as best as can be done.

Use this language in Section 16- Action Required:

All plant shipments of the following listed species received from any infested nursery in California during the period from March 2003 to March 2004 are prohibited from movement pending further notification by USDA APHIS PPQ. See the attached APHIS List of Hosts and Plants Associated with Phytophthora ramorum for the nursery target plants and varieties.

6. Visually inspect any host plants for symptoms. Symptomology is described and illustrated in two nursery guides that may be viewed and printed from <http://www.suddenoakdeath.org/>. See Table 1, **APHIS List of Hosts and Plants Associated with *Phytophthora ramorum***, for the nursery target plants and varieties. Symptoms may include:
 - a. Leaf spots
 - b. Twig dieback
 - c. Stem cankers

Note: Instructions to commence sampling will be sent out from Riverdale, MD when the diagnostic laboratories are ready to accept samples. Listed below are sampling protocols to use *at that time*:

7. Sample and submit symptomatic leaves with stems attached. Use the following guide for minimum sampling amounts (laboratory capacity is limited, so we are varying from a minimum of 40 samples for this situation). If the facility has 1-10 plants on hand, take a minimum of 5 samples; if 11-50 plants are on hand, take a minimum of 10 samples; and if there are more than 50 plants on hand, take a minimum of 20 samples. Look carefully and take samples that show disease symptoms. If you must, submit asymptomatic samples for testing to meet the minimums.
 - a. Fill out PPQ Form 391 (Name of host, variety, state code, facility code, etc.).
 - b. Assign a unique sample number using the following conventions:
XX-ABC-0001
where XX is your two-letter state code, ABC is a three-letter, state-assigned facility code, and 0001 is the sample number for that facility.
 - c. Log each sample according to the unique sample number.
 - d. Double bag samples (e.g., symptomatic and/or asymptomatic leaf tissue with associated twig intact) in plastic.
 - e. Label with collection date, time, location, responsible party. Be sure to write sample number on the bag containing the sample.
 - f. Refrigerate, but do not freeze specimen.
 - g. Submit with minimal delay to your designated laboratory for analysis.
 - h. Overnight the sample if necessary.
8. Inspect greenhouse/nursery waste and refuse piles.
9. Ask owner/manager to identify “cull piles.” Inspect these for plant tissue bearing symptoms. Take samples as above if host material is present.
10. If survey requires you to move among multiple greenhouses, disinfect tools, hands and shoes (or wear disposable gloves and booties) to prevent pathogen spread between greenhouses (see Table 2). If using disposable gloves and booties, be sure to dispose of these after each individual greenhouse/shade house/block inspection.

Disposable gloves and booties should be bagged and disposed by burial or incineration, or in a landfill.

11. Isolate or at least segregate plants identified from trace forward procedure.
12. Sanitize/disinfect tools, hands and shoes before leaving premises, using an appropriate disinfectant for the control of *Phytophthora spp.* (such as 1/9 solution of chlorine bleach or 70% or better solution of ethanol) (See Table 2).

Note: Plants will remain on hold until analysis is completed and a decision is made on final disposition.

Table 1. APHIS List of Hosts and Plants Associated with *Phytophthora ramorum*.
This list is constantly being updated. The most current version is posted at:
www.aphis.usda.gov/ppq/ispm/sod

Table 2. Disinfectants and Fumigants for Use in Nurseries.

A number of disinfectants are registered for use on nonporous surfaces that may effectively reduce populations of *Phytophthora* species. The following table modified from <http://cpmcnet.columbia.edu/dept/ehs/decon.html> examines the effects of different classes of disinfectants on microbial populations. This list is for explanation and information only. Few disinfectants are specifically labeled for *Phytophthora* species and are shown in **Bold**.

All labels for the disinfectants listed below must be strictly adhered to for maximum efficacy and environmental and worker safety.

Summary of Disinfectant Activities

Disinfectant	Trade names	Comments	Contact time
Alcohols (ethyl and isopropyl) 60-85%	Lysol Spray	Evaporates quickly so that adequate contact time may not be achieved, high concentrations of organic matter diminish effectiveness; flammable.	10-15 minutes
Phenolics (0.4%-5%)	Pheno-cen	Phenol penetrates latex gloves; eye/skin irritant; remains active upon contact with organic soil; may leave residue.	10-15 minutes

Disinfectant	Trade names	Comments	Contact time
Quaternary Ammonium (0.5-1.5%)	Consan Triple Action 20 Physan 20 Green-Shield 20	May be ineffective against <i>Pseudomonas</i> and other gram – bacteria; recommendation limited to environmental sanitation (floors, walls). Low odor, irritation.	10-15 minutes
Chlorine (100-1,000 ppm)	10% Clorox 10% Bleach	Inactivated by organic matter; fresh solutions of hypochlorite (Clorox) should be prepared daily; corrosive; irritating to eyes and skin. Exposure to sunlight further reduces hypochlorite efficacy. Keep solution in opaque container.	10-15 minutes
Peroxides (0.1-2%)	Zerotol Oxidate TerraClean	Inactivated by organic matter, no residual activity. Photosensitive. Use according to labels.	Soil treatment